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Effects of Individual Programmed Instruction of Initial Reading Skills and Language Behavior in Early Childhood.

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Descriptors-*Basic Reading, Language Ability, Mechanical Teaching Aids, *Preschool Children, *Programed Instruction, *Reading Skills, Sight Vocabulary, Word Recognition

Identifiers-Edison Responsive Environment

The effects of the Edison Responsive Environment, a computerized typewriter on the development of primary reading skills are discussed. Subjects were 27 3- and 4-year-old children from lower and middle socioeconomic classes. A three-phase program taught these children to relate the names of letters to their upper- and lowercase graphic symbols, to form words from these letters, and to develop a sight vocabulary for typed letters, words, and stories. Research data from the 12 pre- and post-tested children indicated that after 5 months they could recognize all uppercase letters and some lowercase letters. They could type and recognize their own names. There was no significant difference in language facility development, and there were no significant differences between the performances of children from the different socioeconomic classes, even though a 17-point discrepancy in IQ was noted. It was concluded that the children did acquire primary reading skills through the use of this machine. Teaching machines are recommended for young children whose attention spans are short. References are included. (BS)

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EFFECTS OF INDIVIDUAL PROGRAMMED INSTRUCTION ON INITIAL READING SKILLS AND LANGUAGE BEHAVIOR IN EARLY CHILDHOOD

INTERNATIONAL READING ASSOCIATION

Session : Thursday, April 25, 1968
4:30-5:30 p.m.
Room 2-C War Memorial
Boston, Massachusetts

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Within the past few years educators have directed increasing attention toward the development of "pre-school" training programs. As a result, numerous attempts have been made to determine:

(1) The deficits that accrue to children who seem to lack early experiences leading to school success.

(2) The value of varied approaches to training the young.

For example, Deutsch (4) established a relationship between early stimulation and upper elementary school performance.

Durkin (5), in her research, asserted advantages for earlier readers, and Bereiter and Engleman (1) are now working on that premise. After synthesizing voluminous research, Chall (2) pointed to results in later achievement in cases where children had learned the alphabet before reading. The desirability of learning the letters prior to actual reading has also been stressed by Durrell (6).

Moore (8), with Kobler, developed a "computerized typewriter" on which children of three and four years of age learned to read, write, and compose stories as well as to type.

The machine can be programmed in a variety of ways with any desired sequence of letters or words - to "talk," play games, read aloud, show pictures and take dictation. Known commercially as the Edison Responsive Environment (ERE), the equipment is being used in several settings throughout the country. Since Moore looks upon each learner as unique and individual, programming for the machines varies. The pilot study reported here is an attempt to gauge the effectiveness of the use of the ERE (Model 3) in conjunction with a non-automated

typewriter in teaching three and four year olds over a five month period. In addition, efforts were made to determine the effects of the treatment upon language facility.

PROCEDURES

Sample

The sample for this pilot study comprised 27 children - 15 paid tuition and 12 did not. The latter group were children of primarily low socio-economic status (i.e. neighborhood children participating in a Get-Set program). The mean age for the tuition group was 49 months while the mean age for the non-tuition group was 49 months. Mean IQ score, as measured by the Stanford Binet Intelligence Scale (1960 revision), was 118 for the tuition group and 100 for the non-tuition children.

Treatment

A daily 15 minute session was provided for the three year old, 20 minutes for the four year old. The adult-child ratio was 1:1.

All children were offered the treatment daily with daily option of refusing. A combination of both automated and non-automated equipment was used. The choice of instrument for a given day was dependent upon the discretion of the teacher and the availability of the automated equipment. However, all of the subjects received approximately 80% of the total instructional time on the automated machine.

The non-automated booth contained a typewriter, as well as audio-visual equipment and Instructo (7)

materials. In this setting, the assistant sat at the child's side in order to operate the equipment manually, while in the automated booth, the machine was operated from a central panel and the child was observed through a one-way mirror. A daily record was kept of time spent, stroke count, and performance. During the time of treatment the training area in the automated setting was bare, except for the equipment, and the temperature was controlled at 72°.

A three phase program developed in the automated setting in which each child was:

(1) to demonstrate the ability to match names of alphabet letters to their graphic symbols

(2) to demonstrate the ability to type letters from dictation

(3) to demonstrate skill in reading words orally

Phase I

In the first session with the machine, the child was confronted with what appeared to be a standard electric typewriter with colored keys. The child could explore the keyboard freely. After the depression of a key, the name of the letter was pronounced and its symbol appeared. Each depression locked the keyboard until the machine voiced the letter name. The child remained in this phase until he was able to relate the names of the letters to their graphic symbols.

Phase II

After a child had learned the alphabet, he was to learn that letters form words. The child typed from instructions provided by the machine program or by the booth assistant. The machine locked automatically so that nothing except the letters for forming desired words could be typed.

Phase III.

In this stage, the machine was programmed so that different things (e.g. letters, words, stories) could be typed at will. The child's ability to read what he, or the machine, had typed, was taken as evidence of his sight vocabulary.

Analysis of Data.

All children were pre-tested on the following variables:

(1) alphabet recognition for both upper and lower case letters

(2) ability to type words

(3) size of sight vocabulary

At the end of five months, these skills were reassessed and the results were compared to earlier testing. In the case of alphabet recognition, a comparison of pre- and post-test scores were made. Since none of the children could initially type or read, only post-test data are reported for these two variables.

The following category system was devised for classification of the data.

ALPHABET RECOGNITION

Level	Performance
1	none
2	some upper case
3	all upper case
4	some upper and lower case
5	all upper and lower case

TYPING

Level	Performance
1	none
2	types name
3	types name and short words
4	types from dictation

SIGHT VOCABULARY

Level	Performance
1	none
2	name
3	1 - 9 words
4	10 - 25 words

To gauge language facility, the Dailey Language Facility Test (3) was used. This instrument is a three picture test, administered individually, designed to measure facility in the use of oral language independent of vocabulary and specific information. The correct identification of objects in the pictures is not rated. Scores are based upon elaboration of response, i.e. a one word response receives a score of 1 while a creative story is scored at 9. The highest score obtainable, then, is 27. In a previous study, reliability was .75 using three scorers. Data utilized in this study were collected from the 12 children who were present on both pre- and post-testing dates. The means were compared by a t test.

Findings

Alphabet recognition. At the time of the pre-test, the median performance fell within Level 2. This would indicate that the group had the ability to recognize some, but not all, upper case letters, and no lower case letters. At the time of the post-test, the median performance was within Level 4. Recognition of all upper case letters had by then been acquired in addition to some, but not all, lower case letters.

Typing. At the end of the five month period, the median performance for the entire group was within Level 2. This indicates that the

children could type their names, but not other words.

Sight Vocabulary. Data on this variable revealed that the median level after the experimental period fell within Level 2. At this stage, children could recognize their names but not other words.

Language Facility. With regard to this variable, the difference between the means of pre- and post-tests were found to be nonsignificant. ($t = 1.10$)

No differences were found between the performance of tuition and non-tuition children on any of the variables, nor were any differences found between boys and girls.

Discussion

The findings of this study corroborate those of Moore (1967) in that children did acquire primary reading skills through use of the Edison Responsive Environment. The non-tuition children and the tuition children showed similar learning rates. This finding was unexpected in that performance on IQ tests showed a 17 point discrepancy in favor of the tuition group.

Since much current literature points to increasing intellectual deficits for educationally deprived children as they progress through the school years, the early childhood years would seem crucial ones for such training. Pines (9) brings much evidence to bear on the importance of the years from one to six, as years of prime receptivity for academic learning.

Until recently, the transmission of specific skills related to our culture was contingent upon an instructor (parent or teacher) and/or materials. With the advent of the teaching machine, the learner can now be independent of the instructor. He becomes actively involved, gets immediate feedback about his actions, and

progresses at his own pace. This process is carried on in a setting in which a person to person interaction is not essential.

While the effectiveness of teaching machines has yet to be fully determined, this means of instruction would appear to be well suited to the young child who may possess a short attention span and an affinity for manipulating the environment.

Controlled research is needed to account for possibilities of Hawthorne Effect and maturation, and follow up is necessary to gauge long term gains. However, effects of early instruction have shown that children can and do learn in what were formerly called the "pre-school" years.

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